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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FINAL

EXPERIMENTS MISSION RULES

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APOLLO 17

ALSEP 5

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PREPARED BY

FLIGHT CONTROL DIVISION

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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REV A

FINAL EXPERIMENTS MISSION RULES

APOLLO 17

ALSEP 5

PREFACE

THIS DOCUMENT CONTAINS THE EXPERIMENTS MISSION RULES FOR ALSEP 5 AS OF OCTOBER 15, 1972. EACH REVISION TO THIS DOCUMENT WILL BE PRINTED ON DIFFERENT COLORED PAPER FOR EASY RECOGNITION.

THIS DOCUMENT HAS BEEN PREPARED BY THE FLIGHT CONTROL DIVISION, MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, WITH TECHNICAL ASSISTANCE BY LTV/KENTRON HAWAII, LTD.

IT IS SUGGESTED THAT ANY ORGANIZATION HAVING COMMENTS, QUESTIONS, OR SUGGESTIONS CONCERNING THESE MISSION RULES CONTACT MR. JOHN H. TEMPLE, FLIGHT OPERATIONS AND RECOVERY BRANCH, BUILDING 30, ROOM 2058, 713-483-4126.

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APOLLO 17

FINAL EXPERIMENTS MISSION RULES

ALSEP 5

REV A

PREFACE

THIS DOCUMENT CONTAINS REVISION A TO THE FINAL EXPERIMENTS MISSION RULES FOR ALSEP 5 AS OF NOVEMBER 24, 1972. THIS REVISION IS PRINTED ON YELLOW PAPER AND EACH SUBSEQUENT REVISION WILL BE PRINTED ON A DIFFERENT COLOR OF PAPER FOR EASY RECOGNITION.

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HOWARD W. TINDALL, JR.
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1 INTRODUCTION AND PURPOSE

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INTRODUCTION AND PURPOSE

MISSION RULES ARE PROCEDURAL STATEMENTS THAT PROVIDE FLIGHT CONTROL PERSONNEL WITH GUIDELINES TO EXPEDITE THE DECISION-MAKING PROCESS. THE RULES ARE BASED ON AN ANALYSIS OF MISSION EQUIPMENT CONFIGURATION, SYSTEMS OPERATIONS AND CONSTRAINTS, AND MISSION OBJECTIVES. THE DIRECTOR OF FLIGHT OPERATIONS, MANNED SPACECRAFT CENTER, HOUSTON, TEXAS, HAS THE OVERALL RESPONSIBILITY FOR THE PREPARATION, CONTENTS, AND CONTROL OF THE EXPERIMENT MISSION RULES FOR ALSEP.

THE ALSEP MISSION RULES ARE PUBLISHED UNDER SEPARATE COVER FROM THE FLIGHT MISSION RULES BECAUSE OF THE DIFFERENCE IN LIFETIME OF THESE EXPERIMENT OPERATIONS AND SPECIFIC MISSION-ORIENTATED ACTIVITIES. THE EXPERIMENT MISSION RULES DOCUMENT CONTAINS ALL ALSEP MISSION RULES INCLUDING:

A. ALL MISSION RULES AFFECTING CREW INTERFACE WITH THE ALSEP
B. ALL MISSION RULES AFFECTING MCC INTERFACE WITH THE ALSEP THROUGH SYSTEMS LIFETIME

THE FLIGHT MISSION RULES DOCUMENT ALSO CONTAINS ALL ALSEP RULES INVOLVING FLIGHT CREW INTERFACE. ALSEP RULES IN THE FLIGHT MISSION RULES DOCUMENT ARE ASSIGNED THE SAME NUMBERS FOR EASE OF CROSS REFERENCE. THE FLIGHT MISSION RULES WILL TAKE PRECEDENCE SHOULD ANY CONFLICTS EXIST BETWEEN IT AND THIS DOCUMENT BECAUSE OF REVISION CYCLES.

MISSION RULES CAN BE CATEGORIZED AS GENERAL AND SPECIFIC. GENERAL MISSION RULES CONTAIN THE BASIC PHILOSOPHIES USED IN THE DEVELOPMENT OF THE EXPERIMENT MISSION RULES. SPECIFIC MISSION RULES PROVIDE THE BASIC CRITERIA FROM WHICH REAL-TIME DECISIONS ARE MADE AND ARE FORMATTED AS FOLLOWS:

A. THE "CONDITION/MALFUNCTION" COLUMN DEFINES THE FAILURE.
B. THE "PHASE" COLUMN IDENTIFIES THE TIME INTERVAL IN WHICH THE CONDITION/MALFUNCTION OCCURS.
C. THE "RULING" COLUMN DEFINES FLIGHT CONTROLLER ACTION AND/OR PROCEDURES THAT MUST BE ACCOMPLISHED AS A RESULT OF THE CONDITION.
D. THE "CUES/NOTES/COMMENTS" COLUMN PROVIDES THE FLIGHT CONTROLLER WITH ADDITIONAL INFORMATION CONCERNING THE CONDITION/MALFUNCTION AND/OR RULING.

NOTE

THERE WILL BE A SEPARATE SET OF MISSION RULES FOR THE EXPERIMENT PACKAGES FOR EACH MISSION.

2 GENERAL RULES
AND SOP'S

R	ITEM	
		GENERAL
	2-1	THE EXPERIMENT MISSION RULES OUTLINE PREPLANNED DECISIONS DESIGNED TO MINIMIZE THE AMOUNT OF REAL-TIME RATIONALIZATION REQUIRED WHEN NON-NOMINAL SITUATIONS OCCUR DURING AND AFTER CREW ACTIVATION OF THE ALSEP.
	2-2	WHEN A CONFLICT OF PLANNED EXPERIMENT PACKAGE ACTIVITIES OCCUR, THE LUNAR EXPERIMENTS OFFICER WILL DETERMINE THE PRIORITY OF ACTIVITIES, WITH CONCURRENCE OF THE SCIENCE TEAM LEADER.
	2-3	IN SOME INSTANCES, THE SPECIFIC MISSION RULES MAY DEVIATE FROM THE GENERAL GUIDELINES OR FROM THESE GENERAL RULES. THE SPECIFIC MISSION RULE WILL APPLY IN ALL CASES, AND THE DEVIATIONS FROM THE GENERAL GUIDELINES WILL BE NOTED.
	2-4	THE LUNAR EXPERIMENTS OFFICER MAY, AFTER ANALYSIS OF THE OPERATION, CHOOSE TO TAKE ANY NECESSARY ACTION REQUIRED FOR SUCCESSFUL COMPLETION OF EXPERIMENT TEST OBJECTIVES.
	2-5	MISSION RULE LIMITS THAT ARE CONSIDERED TO BE INTERIM OR UNCONFIRMED NUMBERS WILL BE UNDERLINED IN THIS PUBLICATION AND ALL SUBSEQUENT REVISIONS UNTIL THE NUMBERS ARE CONFIRMED BY THE RESPONSIBLE NASA AGENCY.
	2-6	THE SYSTEMS LIMITS LISTED IN THESE RULES ARE THE ACTUAL VEHICLE LIMITS (AS WELL AS THEY ARE KNOWN AND UNDERSTOOD) AND ARE NOT BIASED TO COMPENSATE FOR THE DELAYS OR INSTRUMENTATION ERRORS WITHIN THE EXPERIMENT AND STDN DATA/DISPLAY SYSTEMS.

3 ALSEP
OPERATIONAL
GUIDELINES

R	ITEM

ALSEP OPERATIONAL GUIDELINES

32-1 GENERAL

A. THESE ALSEP GENERAL OPERATIONAL GUIDELINES ARE BASED ON OBJECTIVES IN THE FOLLOWING PRIORITIES:

1. HFE (HEAT FLOW EXPERIMENT)
2. LSP (LUNAR SEISMIC PROFILING)
3. LSG (LUNAR SURFACE GRAVIMETER)
4. LMS (LUNAR MASS SPECTROMETER)
5. LEAM (LUNAR EJECTA AND METEORITES)

NOTE

RIPPLE-OFF SEQUENCE IS:

1. PDR 1 (7W)
2. PDR 2 (14W)
3. LMS
4. LEAM
5. HFE
6. LSG
7. LSP

B. THE GATHERING OF SCIENTIFIC DATA WILL NOT BE COMPROMISED FOR ENGINEERING OR TEST PURPOSES.

C. REDUNDANT OR BACKUP SYSTEMS WILL NOT BE SELECTED UNLESS A FAILURE WARRANTS SUCH ACTION. SWITCHING TO REDUNDANT SYSTEMS WILL NOT BE ACCOMPLISHED TO SATISFY ENGINEERING TESTS UNLESS ALL SCIENTIFIC MISSION OBJECTIVES HAVE BEEN COMPLETED.

D. NORMAL BIT RATE WILL BE USED UNLESS SELECTION OF LOW BIT RATE IS REQUIRED FOR THE COLLECTION OF ALSEP DATA.

E. BEFORE IMPLEMENTING ANY MISSION RULE ACTION BASED ON AN APPARENT ALSEP MALFUNCTION, IT WILL BE ASCERTAINED THAT THERE IS NO PROBLEM WITH THE STDN SUPPORTING SITE.

A F. UPLINK SWITCH INHIBIT CMD 174 WILL BE SENT TO INHIBIT THE UPLINK SWITCH FUNCTIONS.

R	ITEM
	32-1 (CONT)

G. ALSEP EXPERIMENTS WILL NOT BE COMMANDED TO "OFF" UNLESS THE ACTION IS JUSTIFIED BY AN ANOMALY.

A H. NO COMMAND FUNCTION CAN BE EXECUTED IN AN EXPERIMENT (OTHER THAN "OFF," OR "OPERATE"), BY GROUND COMMAND OR BY ONBOARD TIMER, UNLESS THE EXPERIMENT IS IN THE "OPERATE" MODE.

I. THE ALSEP SHORTING SWITCH WILL BE ACTIVATED ASAP AFTER CENTRAL STATION DEPLOYMENT.

J. IF THE GROUND IS UNABLE TO OBTAIN DOWNLINK, THE GROUND WILL REQUEST THE ASTRONAUT TO ROTATE THE RESET POWER SWITCH TO RESET AND THEN TO POWER.

K. THE CENTRAL STATION APM AND PDR WILL BE USED TO MAINTAIN AN AVERAGE INTERNAL THERMAL PLATE TEMPERATURE GREATER THAN 0 DEGREES F AND LESS THAN 132 DEGREES F UNLESS THERE IS AN ANOMALY REQUIRING THE APM TO BE OFF AND/OR THE POWER IS REQUIRED TO MAINTAIN EXPERIMENT INTEGRITY.

L. RESERVED

M. THE HFE BORE HOLES WILL HAVE PRIORITY OVER THE DRILL CORE STEM. THE HFE BORE HOLES WILL BE ATTEMPTED FIRST. IF PROBLEMS ARE ENCOUNTERED, EFFORTS ON BORE HOLES WILL BE TERMINATED AFTER A TOTAL OF 20 MINUTES ACCUMULATED DRILL "ON" TIME.

N. IF A HARD OBJECT IS ENCOUNTERED THAT REDUCES DRILL RATE TO LESS THAN APPROXIMATELY 5 INCHES PER MINUTE ON EITHER HFE PROBE HOLE, THE FOLLOWING WILL BE ACCOMPLISHED:

1. IF THE SECOND STEM SECTION IS NOT ATTACHED, WITHDRAW AND START AT A DIFFERENT LOCATION FOR MAXIMUM OF TWO WITHDRAWALS.

2. IF THE SECOND STEM IS ATTACHED, CONTINUE UNTIL APPROXIMATELY 10 MINUTES OF POWER "ON" TIME FOR THE DRILL STRING HAS ELAPSED.

A O. HFE CONDUCTIVITY MEASUREMENTS IN MODE II AND MODE III WILL PLAN TO BE COMPLETED PRIOR TO TERMINATION OF CONTINUOUS REAL-TIME SUPPORT.

P. IF THE CREW MUST RETURN TO THE LM PRIOR TO COMPLETE ALSEP DEPLOYMENT, THE SHORTING SWITCH WILL BE ACTIVIATE "ON" IF THE ANTENNA IS EMPLACED. IF THE ANTENNA IS NOT EMPLACED, THIS SWITCH WILL NOT BE ACTIVATED (PICK UP HERE ON EVA 2).

R	ITEM
	32-1 (CONT)

Q. THE LSP IS THE ONLY EXPERIMENT THAT WILL BE COMMANDED WHILE IN LSP FORMAT.

R. THE ALSEP WILL BE IN LSP FORMAT DURING LM LIFT-OFF AND LM ASCENT STAGE IMPACT.

S. FOR ANY MALFUNCTION DURING A SURFACE TASK, A MAXIMUM OF 10 MINUTES WILL BE SPENT ON THE CONTINGENCY PROCEDURE BEFORE THE TASK IS ABANDONED, WITH THE FOLLOWING EXCEPTIONS:

1. RTG FUELING

   UP TO 20 MINUTES WILL BE ALLOWED IN EXERCISING RTG FUELING CONTINGENCY PROCEDURES.

2. ALSEP PACKAGE 1 TO PACKAGE 2 CABLE CONNECTIONS

   UP TO 20 MINUTES WILL BE ALLOWED FOR MAKING THE CABLE CONNECTION.

3. ALSEP ANTENNA

   UP TO 30 MINUTES WILL BE ALLOWED FOR ERECTION AND ALIGNMENT.

A

NOTE

MOVING ALSEP DEPLOYMENT TO LATER EVA WILL BE CONSIDERED IF ADDITIONAL TIME SPENT ON CONTINGENCY PROCEDURES ARE REQUIRED TO ATTAIN AN OPERATIONAL ALSEP.

T. FOR EVA TERMINATION OR OTHER INTERRUPTIONS DURING ALSEP DEPLOYMENT, THE FOLLOWING PREFERRED DEPLOYMENT INTERRUPTION POINTS WILL BE OBSERVED IF PERMITTED BY CREW SAFETY CONSIDERATION:

1. REMOVE ALSEP PACKAGES 1 AND 2 / CLOSE SEQ BAY DOOR / REPOSITION ALSEP PACKAGES WITH HANDLES UP AND WITH EXPERIMENTS FACING THE SUN WITHIN ±15 DEGREES.

2. TILT FUEL CASK (DOME NOT REMOVED).

3. TILT FUEL CASK / REMOVE DOME / DO NOT DEFUEL.

4. FUEL RTG / THEN CARRY ALSEP TO DEPLOYMENT SITE / REMOVE SUBPALLETS FROM PACKAGE 2 / CARRY PACKAGE 1 TO EMPLOYMENT SITE / DO NOT ACTUATE SWITCHES.

Λ 5. CONNECT RTG, HFE, AND LEAM CABLES CS / REMOVE LSP TO G/M, LSG, AND LMS FROM SUB-
Λ PACKAGE 1 /ALIGN CS AND RAISE SUNSHIELD / RAISE ANTENNA MAST / MOUNT GIMBAL, AND ANTENNA / LEVEL AND ALIGN ANTENNA / ROTATE SHORTING SWITCH ON WAY BACK TO LM.

6. DEPLOY ALSEP EXPERIMENTS AND COMPLETE TASKS / A HOLD POINT EXISTS AFTER
Λ EACH EXPERIMENT IS DEPLOYED / ROTATE SHORTING SWITCH ON WAY BACK TO LM.

R	ITEM	
	32-1 (CONT)	U. IF ALL SPOTS ON TEMP LABEL ON HORSE COLLAR ARE BLACK AFTER FUELING RTG, CREW
A		MUST REMOVE HORSE COLLAR WITH UIT AND SET IT ASIDE. CREW MUST NOT TOUCH
A		HORSE COLLAR UNTIL IT HAS COOLED SUFFICIENTLY (10 MINUTES).
		V. ALSEP DEPLOYMENT WILL NOT BE STARTED IF IT IS KNOWN THAT LESS THAN 1 HOUR
		15 MIN IS AVAILABLE FOR ALSEP IN EVA 1.
	32-2	LMS
A		A. THE LMS WILL BE TURNED ON ASAP AFTER DEPLOYMENT TO VERIFY HIGH VOLTAGE AND EMISSION
A		OFF AND SET BAKE-OUT HEATER FLAG TO OFF.
		B. THE DUST COVER WILL BE REMOVED AFTER THE LAST LSP CHARGE HAS DETONATED
		OR HAS BEEN SAFED OR AM-41 EXCEEDS 160 DEGREES F.
A		C. THE LMS WILL BE BAKED-OUT UNTIL THE ION SOURCE TEMP (AM-6) IS GREATER THAN 210 DEG C
A		FOR 9 HOURS.
		D. THE HV AND FILAMENT WILL NOT BE COMMANDED ON UNTIL AM-05 IS LESS THAN
		0 DEG C AND AM-03 IS LESS THAN 0.3 MICROAMPERES.
	32-3	LEAM
A		A. THE LEAM MIRROR COVER WILL BE REMOVED ASAP AFTER THE LAST LSP CHARGE HAS DETONATED
		OR HAS BEEN SAFED, AND SENSOR COVER WILL BE REMOVED 48 HOURS AFTER SUNSET.
		B. THE LEAM CAL COMMANDS WILL BE INITIATED DAILY OR DURING EACH SUPPORT PERIOD
		BY GROUND COMMAND IF THE SEQUENCE TIMER FAILS OR IS INHIBITED.
		C. THE LEAM WILL BE IN OPERATE MODE (FOR 2 HOURS) ASAP AFTER DEPLOYMENT UNLESS AJ-11 IS
		GREATER THAN OR EQUAL TO 150 DEG F AT WHICH TIME THE LEAM WILL BE COMMANDED TO OFF.
		D. IF AJ-011 REACHES 167 DEG F IN THE OFF MODE, THE MIRROR COVER WILL BE RELEASED.
	32-4	LSG
		A. THE LSG WILL BE COMMANDED "ON" ASAP AFTER DEPLOYMENT.
A		B. THE CREW WILL REPORT RECHECK OF LEVEL AND ALIGNMENT AND FREEDOM OF GIMBAL AFTER
		EXPERIMENT IS MANUALLY UNCAGED.

R	ITEM	
	32-4 (CONT)	C. SLAVE HEATER POWER OFF (COMMAND 064) WILL BE COMMANDED PRIOR TO BEGINNING A MASS CHANGE OR BEAM CAGING COMMAND SEQUENCE.
A		D. SLAVE HEATER WILL BE COMMANDED "ON" AFTER MASS AND BEAM CAGING SERVOS ARE COMMANDED OFF
		E. THE SENSOR BEAM WILL BE CAGED PRIOR TO COMMANDING THE MASS CHANGING MOTOR ON.
		F. THE COMMAND DECODER WILL BE COMMANDED OFF AND THE SLAVE HEATER COMMANDED ON PRIOR TO COMMANDING THE EXPERIMENT TO STBY OR OFF.
		G. THE NORMAL CONDITION FOR THE COMMAND DECODER IS POWER OFF, UNLESS ACTIVELY ENGAGED IN COMMANDING OF LSG MULTIPLEXED COMMANDS. IF THE DECODER IS TO BE IDLED FOR 10 MINUTES OR MORE BETWEEN COMMANDS, SET ALL ZEROS IN THE REGISTER FOR THE IDLE PERIOD.
		H. THE SCREW SERVO AND TILT SERVO WILL NOT BE OPERATED SIMULTANEOUSLY.
		I. NORTH/SOUTH TILTING OPERATIONS WILL ALWAYS BE COMPLETED PRIOR TO BEGINNING EAST/WEST TILTING OPERATIONS.
		J. THE FINAL ADJUSTMENTS OF THE SCREW SERVOS SHOULD ALWAYS BE A VERNIER DRIVE IN THE UP DIRECTION.
		K. INSURE RESERVE POWER IS 14 WATTS OR GREATER BEFORE COMMANDING MASS CHANGE MOTOR ON.
A A		L. IF COMMAND OCT 070 IS SENT AND THE COMMAND REGISTER IS NOT RESET TO ZERO, THE COMMAND DECODER WILL NOT BE COMMANDED OFF.
	32-5	LSP
		A. RESERVED
		B. RESERVED
		C. A 30 MINUTE LISTENING MODE WILL BE PLANNED WEEKLY.
		D. THE ALSEP WILL BE IN LSP FORMAT AND FIRE PULSES TRANSMITTED FOR 1 HOUR PRIOR TO THE FIRST NOMINAL TIME-OUT TO 2 HOURS AFTER THE LAST NOMINAL TIME OUT FOR EACH GROUP OF E/P'S ON AN EVA.
A A		E. DEPLOYMENT OF AN LSP EXPLOSIVE PACKAGE (EP) WILL BE TERMINATED ANY TIME LESS THAN FOUR SAFETY FEATURES REMAIN. THE FOLLOWING CONDITIONS MUST BE MET BEFORE THE EP CAN DETONATE: 1. ASTRO SWITCH 2 ROTATED TO CW (ENABLE) POSITION. ENABLES 29 V TO THE LSP CENTRAL ELECTRONICS. 2. LSP "OPERATE" CMD (OCTAL 055) RECEIVED BY LSP CENTRAL ELECTRONICS.

R	ITEM	
	32-5 (CONT)	3. LSP TRANSMITTER PULSES ENABLE CMD (OCTAL 156) RECEIVED BY LSP CENTRAL ELECTRONICS.
A		4. LSP FORMAT ON CMD (OCTAL 003) RECEIVED BY THE ALSEP CENTRAL STATION DDP.
A		5. SAFE/ARM SLIDE TO THE ARM POSITION.

NOTE

STATUS OF EACH OF THE PRECEEDING FIVE SAFETY FEATURES IS AS FOLLOWS:

	FEATURES SAFED	TOTAL NUMBER SAFED
ALSEP DEPLOYMENT	1,2,3,4,5	5
CHARGE DEPLOYMENT	2,3,4,5	4
LSP PASSIVE LISTENING*	3,5	2

*NOT PLANNED WHILE CREW IS ON SURFACE.

A A A BATTERY TIMER AND CIRCUIT ACTIVATION IS NOT CONSIDERED IN THE ABOVE SAFETY FEATURES BECAUSE NO STATUS INDICATIONS EXISTS AFTER THE PIN HAS BEEN PULLED.

F. DO NOT ACTIVATE LSP ANTENNA UNLESS DEPLOYED GREATER THAN 6 METERS FROM THE CENTRAL STATION.

32-6 HFE

A. SEQUENTIAL COMMAND UPLINKED TO THE HFE WILL BE SEPARATED BY AT LEAST 54 SECONDS IN NORMAL BIT RATE AND 108 SECONDS IN LOW BIT RATE.

B. A CONDUCTIVITY MEASUREMENT WILL NOT BE INITIATED UNLESS THERE WILL BE SUFFICIENT POWER TO COMPLETE THE MEASUREMENT WITHOUT INTERRUPTION. ONCE A PROBE HEATER IS TURNED ON FOR AN EXPERIMENT, IT WILL NOT BE TURNED OFF UNLESS THE CONDUCTIVITY MEASUREMENT IS TO BE TERMINATED, OR OTHER ALSEP CONTINGENCIES ARE TO BE CORRECTED.

A C. WHEN OPERATING IN MODE I, HEATER STATE "OFF" WILL BE SELECTED.

A D. HFE WILL BE IN MODE I WHEN SELECTING PCU'S.

R	ITEM	
	32-7	INSUFFICIENT POWER FOR SIMULTANEOUS SUPPORT OF ALL EXPERIMENTS
A		AUTO THERMAL CONTROL OF THE EXPERIMENTS WILL BE INHIBITED IF ADEQUATE POWER IS NOT AVAILABLE. THERMAL CONTROL WILL BE MANUALLY MANAGED TO PRECLUDE RIPPLE-OFF OF EXPERIMENTS. INDIVIDUAL EXPERIMENT COMMANDS THAT REQUIRE CENTRAL STATION HEATER POWER WILL BE HELD TO A MINIMUM. CENTRAL STATION AVERAGE TEMPERATURES WILL BE
A		ALLOWED TO GO AS LOW AS -10 DEG F IF THE HEATER POWER IS REQUIRED FOR OPERATION OF AN EXPERIMENT.
	32-8	EXPERIMENT INTERFERES WITH ANOTHER EXPERIMENT OR THE CENTRAL STATION
		IF IT IS DETERMINED THAT ANY EXPERIMENT IS A STEADY SOURCE OF INTERFERENCE TO ANOTHER EXPERIMENT, OPERATION OF THE INTERFERING EXPERIMENT WILL BE CURTAILED (BUT NOT TERMINATED) AS LONG AS THAT EXPERIMENT IS STILL RETURNING DATA. IN NO CASE, HOWEVER, WILL ANY EXPERIMENT BE REMOVED FROM ITS DESIRED OPERATIONAL CONFIGURATION FOR MORE THAN 80 PERCENT OF ANY LUNAR DAY (29.5 EARTH DAYS).
	32-9	THE EXPERIMENT STATUS WHILE ALSEP IS IN LSP FORMAT FOR LM ASCENT, LM ASCENT STAGE IMPACT, AND EP DETONATION IS: HFE - ON LSG - ON LEAM - OFF LMS - OFF
		RULE 32-10 IS RESERVED.

4 ALSEP SPECIFIC RULES

MISSION RULES

SECTION 4 - ALSEP SPECIFIC RULES

	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
A	32-11	AVG THERM PLATE - T GREATER THAN OR EQUAL TO 132 DEG F		A. CMD 7W PDR ON. B. CMD 14W PDR ON. C. CMD BOTH 7W AND 14W PDR ON	A. CMD 017 B. CMD 022 C. CMDS 017 AND 022.
A	32-12	AVG THERM PLATE - T LESS THAN OR EQUAL TO - 10 DEG F		CMD ARM OFF	CMD 5A031 APM 1 OFF OR CMD 5A113 APM 2 OFF
A	32-13	AVG THERM PLATE- T LESS THAN OR EQUAL TO ZERO DEG F OR GREATER THAN OR EQUAL TO 125 DEG F		SELECT REDUNDANT APM/PCU SYSTEM	CMD 5A060 PCU 1 CMD 5A062 PCU 2
		RULE NUMBERS 32-14 THROUGH 32-20 ARE RESERVED.			

SECTION 4 - ALSEP SPECIFIC RULES - CONTINUED

	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
	32-21	FAILURE OF AUTO SWITCHOVER TO REDUNDANT PCU		SELECT REDUNDANT PCU.	AUTO SWITCHOVER TO PCU SHOULD OCCUR AT +12 VDC. OUT-OF-LIMITS (LESS THAN 10.8 VDC/GREATER THAN 13.2 VDC), PCU 2 SEL - CMD 062, PCU 1 SEL - CMD 060. THE FOLLOWING TM WILL BE OUT-OF-LIMITS: TM NOMINAL HI LO AE-9 +12 +13.0 +11.0 AE-7 +29 +31.3 +25.7 AE-10 + 5 + 5.4 + 4.6 AE-11 -12 -11.0 -13.0 VERIFY AE-2 CAL VOLTAGES WITHIN LIMITS.
A A A	32-22	RESERVE POWER LESS THAN 2.0 W.		A. VERIFY PDR'S OFF B. COMMAND EXPERIMENTS TO LOWER POWER MODES BEGINNING WITH THE LOWEST PRIORITY EXPERIMENTS.	CUES: CS 60 FOR PCU 1 CS 61 FOR PCU 2
		RULE NUMBERS 32-23 THROUGH 32-30 ARE RESERVED.			

	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
A	32-31	ALSEP FAILS TO RESPOND TO A COMMAND.		A. REINITIATE THE COMMAND. B. REMOVE MODULATION AND REAPPLY MODULATION. REINITIATE THE COMMAND. C. IF UNSUCCESSFUL, SELECT REDUNDANT COMMAND SYSTEM AND REINITIATE THE COMMAND. D. IF UNSUCCESSFUL, WAIT FOR UPLINK SWITCH TO REDUNDANT COMMAND SYSTEM.	CUE: NO FUNCTIONAL VERIFICATION AND/OR NO FUNCTIONAL VERIFICATION WORD (CVW) C. CMD 122 OCT D. UPLINK SWITCH OCCURS EVERY 61 HR, 49 MIN, 35 SEC.
		RULE NUMBERS 32-32 THROUGH 32-34 ARE RESERVED.			

SECTION 4 - ALSEP SPECIFIC RULES - CONTINUED

R	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
	32-35	WEAK TM SIGNAL		A. COMMAND XMTR OFF SELECT REDUNDANT XMTR	A. XMTR A OFF - CMD 013 XMTR A SEL - CMD 012 XMTR B OFF - CMD 014 XMTR B SEL - CMD 015
				B. SELECT LOW BIT RATE	B. LOW BIT RATE SEL-CMD 007
A	32-36	LOSS OF SYNC OR BAD DECOMED DATA		A. SELECT REDUNDANT DDP	A. PROC X SEL - CMD 034 PROC Y SEL - CMD 035 AB-10 D/P STATUS
				B. SELECT REDUNDANT ADP	B. CMD 024 OR 025
				C. SELECT LOW BIT RATE	C. LOW BIT RATE SEL-CMD 007
A A				D. CMD XMTR OFF. SELECT REDUNDANT XMTR.	
	32-37	LOSS OF TM MODULATION		A. SELECT REDUNDANT DPP	A. CMD 024 OR 025
A A				B. COMMAND XMTR OFF. SELECT REDUNDANT XMTR.	B. XMTR A OFF - CMD 013 XMTR A SEL - CMD 012 XMTR B SEL - CMD 014 XMTR B SEL - CMD 015
	32-38	GROUND UNABLE TO COMMAND HIGH BIT RATE OFF		A. SEE RULE 32-31 B. CHANGE DDP, THEN CMD DP FORMAT C. COMMAND UPLINK SWITCH (122) D. SWITCH PCU'S	
		RULE NUMBERS 32-39 THROUGH 32-45 ARE RESERVED.			

	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
A A	32-46	FAILURE OF TIMER INITIATED CAL		MANUALLY COMMAND THE CALS, TWO 111 OCT	
	32-47	FAILURE OF THERMAL CONTROL		MANUALLY CONTROL HEATER STATUS. MAINTAIN AJ-11 BETWEEN -20 DEG F AND 150 DEG F.	DJ-29=1 WHEN HEATER ON. HTR CNTL 117 OCT. HEATER AUTO ON LESS THAN OR EQUAL TO ZERO DEG F. AUTO OFF GREATER THAN OR EQUAL TO 9 DEG F.
		RULES 32-48 THROUGH 32-50 ARE RESERVED FOR LEAM			

	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
	32-51	TEMP LESS THAN MINUS 10 DEG WITH EXP ON		CMD BACKUP HTR ON.	CUE: AM-5 BASEPLATE TEMP CMD CA-7
	32-52	TEMP GREATER THAN 125 DEG F		CMD BACKUP HTR OFF.	CUE: AM-5 BASEPLATE TEMP CMD CA-1
A A A	32-53	FAILURE OF FIXED ION SOURCE MODE		CMD EMISSION AND HV OFF. CA-4 AND CA-15	AM-11 EMISSION CUR NOT EQUAL TO 230 MA.
A A A A	32-54	FAILURE OF CYCLIC ION SOURCE MODE		CMD EMISSION AND HV OFF. CA-4 AND CA-15	AM-11 EMISSION CUR NOT EQUAL TO 85 MA.
A A A	32-55	FAILURE OF FILAMENT		CHO EMISSION AND HV HV OFF. CA-4 AND CA-15	AM-12 OR AM-13 LESS THAN 1.2 AMPS
A		RULES 32-56 THROUGH 32-60 ARE RESERVED FOR LMS.			

	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
	32-61	THERMAL CONTROL FAILS (TEMP HIGH)		A. CHECK PRESSURE XDCER OFF.	PRESSURE XDUCER DISSIPATES 25 W
				B. VERIFY SERVOS OFF.	
A				C. VERIFY DECODER OFF	CUE: DG-04 MORE THAN 52 DEG F CMD 5A064
	32-62	MASS CHANGE MOTOR WILL NOT RUN		A. CMD MASS CHANGE SERVO OFF.	CUE:
A				B. CMD SLAVE HTR OFF	MASS CHANGING IS INHIBITED WHEN THE SLAVE HEATER IS ON. TM INDICATED.
				C. COMMAND MASS SERVO ON.	
A	32-63	BEAM STICKS TOP OR BOTTOM		A. COMMAND SCREW SERVO MOTOR ON, FOLLOWED BY THE VERNIER SLEW COMMAND, WHICH DRIVES THE BEAM AWAY FROM THE STOP.	A. CMD SCREW SERVO ON - LSG MUX CMD 13 VERNIER SLEW UP-21 VERNIER SLEW DOWN-22
				B. UNCAGE BEAM	B. CMD-10
				C. CAGE THEN UNCAGE BEAM	C. CMD-9 THEN CMD-10
A					NOTE: SLAVE HTR MUST BE OFF TO UNCAGE.
A A	32-64	THERMAL CONTROL FAILS (TEMP LOW)		A. CMD PRESSURE XDUCER ON	
A A				B. CMD DECODER ON	
A		32-65 THROUGH 32-70 ARE RESERVED FOR LSG.			

SECTION 4 - ALSEP SPECIFIC RULES - CONTINUED

	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
A A	32-71	TRANSMITTER FAILS TO BEGIN PULSES		SEE RULE 32-31	
	32-72	UNABLE TO COMMAND LSP FORMATTING		A. SEE RULE 32-31 B. CHANGE DDP THEN CMD LSP FMT. C. CMD 007 (LBR). CMD 003 (LSP FMT). CMD 006 (NBR).	MUST BE IN LSP FORMATTING. EXPLOSIVE CHARGE FIRING MODE.
	32-73	UNABLE TO COMMAND DP FORMATTING FROM LSP FORMATTING.		A. SEE RULE 32-31. B. CHANGE DDP, THEN CMD DP FORMAT. C. COMMAND 122 UPLINK SWITCHOVER. D. SWITCH PCU.	
	32-74	GROUND UNABLE TO COMMAND LSP TO STBY.		A. CMD LSP TO OFF. B. CONTINUE MISSION WITH LSP IN OPERATE MODE.	
A	32-75	UNEXPLAINED LOSS OF LOCK ON LSP FMT.		CMD DDP FORMAT CHANGE DP AND RETURN TO LSP FORMAT.	ASSUMES RF CARRIER WITH MODULATION STILL PRESENT
		32-77 THROUGH 32-80 ARE RESERVED FOR LSP			

R	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
	32-81	UNABLE TO DRILL NORMAL HFE EMPLACEMENT HOLES.			
A A		A. IF EITHER HOLE IS LESS THAN 40 INCHES DEEP AND DRILL IS INOPERABLE.		A.1. HAND-AUGER AND HAMMER BORE STEMS INTO SUBSURFACE AT LEAST 40 INCHES. 2. IF UNSUCCESSFUL INSERT PROBE INTO HOLE MADE BY A DOUBLE CORE TUBE. FILL HOLE AROUND PROBE. 3. IF LESS THAN 40 INCHES, LAY PROBE ON SURFACE AND ORIENT BLACK TAPE ON CABLE NORTH/SOUTH.	
A A		B. IF EITHER HOLE IS LESS THAN 40 INCHES AND DRILL IS STILL OPERABLE		B. DRILL DEEP CORE AT SHALLOW BORE LOCATION AND INSERT PROBE IN HOLE THROUGH TREADLE, AND CAVE SOIL IN AROUND PROBE.	B. USE TREADLE AND EXTRACTOR TO HOLD SOIL IN PLACE. MOVE THREADLE AT LEAST 10 FEET DOWN THE CABLE TOWARD THE ELECTRONICS.
A A A		C. IF HOLE IS NOT NOMINAL DEPTH		C. PLACE PROBE IN HOLE AS FAR AS IT WILL GO. EMPLACE LOWER RADIATION SHIELD ON THE TOP OF THE PROBE, EMPLACE MIDDLE RADIATION SHIELD BELOW LUNAR SURFACE OR ON TOP OF PROBE.	
A	32-82	HAVE CHOICE OF DRILLING SECOND HFE HOLE OR CORE SAMPLE HOLE.		DRILL SECOND HFE PROBE EMPLACEMENT HOLE	HFE HAS PRIORITY OVER CORE SAMPLES
A A A	32-83	DRILL RATE REDUCED TO LESS THAN 5 IN./MIN.		A. IF LESS THAN TWO STEM SECTIONS ARE ATTACHED TO THE POWER HEAD, WITHDRAW AND START AT NEW LOCATION FOR MAXIMUM OF THREE LOCATIONS FOR EACH BORE. B. IF TWO OR MORE STEM SECTIONS ARE ATTACHED TO THE POWER HEAD, CONTINUE UNTIL 10 MIN OF POWER ON TIME FOR THE DRILL STRING HAS ELASPED.	

	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
	32-84	HFE INTERRUPTED DURING CONDUCTIVITY MEASUREMENT (HEATER ON) A. DURING MODE II: 1. HEATER GOES OFF. 2. HEATER GOES TO MODE III		A.1. GO TO NEXT CONDUCTIVITY MEASUREMENT. 2. TURN HEATER OFF AND RETURN TO MODE II AND GO TO NEXT HFE CONDUCTIVITY MEASUREMENT. B. IF ON TIME IS MORE THAN 6 HR, GO TO DECAY MODE. IF ON TIME IS LESS THAN 6 HR, GO TO NEXT CONDUCTIVITY MEASUREMENT.	A.2. HFE HTR-CMD 152
A A A A A	32-85	HFE DOWNLINK DATA LOSES SYNC		A. CONDUCTIVITY MEASUREMENT IS IN PROGRESS SWITCH DATA PROCESSOR. 1. DATA PROC X SEL (CMD 034) 2. DATA PROC Y SEL (CMD 035) B. IF CONDUCTIVITY MEASUREMENT IS NOT IN PROGRESS, SEND MODE I CMD IF MODE I STATUS IS DOUBTFUL.	B. MODE I CMD 135
A A A A	32-86	HFE ELECTRONICS REFERENCE TEMPERATURE IS INCREASING TO GREATER THAN 333 DEG K.		SELECT LOWER POWER MODE OR TURN OFF FOR APPROPRIATE AMOUNT OF TIME	CUE: DH-13 T1 REF, CH-15 T2 REF MODE I CMD 135
A A A	32-87	HFE OFF AT LUNAR NIGHT LONGER THAN 6 HRS.		GO TO STBY UNTIL LUNAR SUNRISE	HFE STBY - 046

R	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
	32-88	HFE ELECTRONICS REFERENCE TEMP FAILS TO LESS THAN 273 DEG K.		SELECT IN SEQUENCE HFE STBY - 046 HFE OFF - 050 HFE ON - 045 GO TO SOP 6-13	
A A		RULE NUMBERS 32-89 THROUGH 32-93 ARE RESERVED.			

A ABBREVIATIONS AND ACRONYMS

R | ITEM

ABBREVIATIONS AND ACRONYMS

AC	ALTERNATING CURRENT
A/DC	ANALOG-TO-DIGITAL CONVERTER
ADC	AMPERES DC
ADD	ADDRESS
ALCS	ALSEP COMPUTER SYSTEM
ALIGN	ALIGNMENT
ALSEP	APOLLO LUNAR SURFACE EXPERIMENTS PACKAGE
A/F	AUTOMATIC/FORCED
AMPS	AMPERES
ANT	ANTENNA
AUTO	AUTOMATIC
AZ	AZIMUTH
BCC	BATTERY CHARGE CONTROL
BL	BOTTOM LOCATION OF STRUCTURE TEMPERATURE
BAS	BASE
BER	BIT ERROR RATE
BPS	BITS PER SECOND
CAL	CALIBRATE
CB	CIRCUIT BREAKER
CCGE	COLD CATHODE GAGE EXPERIMENT (PART OF SIDE OF ALSEP 1 AND 4, SEPARATE MSC EXPERIMENT ON ALSEP 3)
CCGE/A	ANALOG AND DIGITAL ID READOUT FROM CCGE
CCGE/D	
CCIG	COLD CATHODE ION GAGE (INSTRUMENT PORTION OF CCGE)
CCW	COUNTERCLOCKWISE
CH	CHANNEL
CHAN	CHANNELTRON - USED IN CPE AS: CHAN/1 CHANNELTRON P/S NO. 1 CHAN/2 CHANNELTRON P/S NO. 2 CHAN/HI CHANNELTRON VOLTAGE INCREASES OFF CHAN/LO CHANNELTRON VOLTAGE INCREASES OFF
CMD	COMMAND
CNT	COUNT
CNTR	COUNTER
COMM	COMMUNICATION
CONV	CONVERTER
CPLEE	CHARGED-PARTICLE EXPERIMENT (FULL NAME IS CHARGED-PARTICLE LUNAR ENVIRONMENT EXPERIMENT)
CPE	
CPS	CYCLES PER SECOND
CS	CENTRAL STATION
CTL	CONTROL
CVR	COVER
CVW	COMMAND VERIFICATION WORD
CW	CLOCKWISE
DB	DECIBELS
DBM	DECIBELS WITH RESPECT TO ONE MILLIWATT
DC	DIRECT CURRENT
DEC	DECODER
DET	DETECTOR
DIG	DIGITAL
DIR/V	DIRECTION AND SPEED (USED ON PSE)
DISSIP	DISSIPATION
DLAY	DELAY
D/P	DATA PROCESSOR
DPLY	DEPLOY
DRT	DOME REMOVAL TOOL
DSS	DATA SUBSYSTEM - COMPONENTS INCLUDE: DSS/A ANALOG DATA PROCESSOR DSS/D DIGITAL DATA PROCESSOR DSS/PROC COMPLETE DATA PROCESSOR (REDUNDANT)

R	ITEM	
		EA — ELECTROSTATIC ANALYZER
		EPS — ELECTRICAL POWER SYSTEM
		EVA — EXTRAVEHICULAR ACTIVITY
		EXP — EXPERIMENT
		F — FAHRENHEIT
		FET — FIELD EFFECT TRANSISTOR
		FLD — FIELD
		FMR — FLIGHT MISSION RULES
		FREQ — FREQUENCY
		FTT — FUEL TRANSFER TOOL
		GDT — GRADIENT SENSOR DELTA TEMPERATURE (HFE)
		GEO — GEOPHONE
		GLA — GRENADE LAUNCHER ASSEMBLY
		GMBL — GIMBAL
		GND — GROUND
		GRS — GAMMA RAY SPECTROMETER
		GT — GRADIENT SENSOR AMBIENT TEMPERATURES (HFE)
		HBR — HIGH BIT RATE
		HFE — HEAT FLOW EXPERIMENT
		HTR — HEATER - ON HFE, THERE ARE TWO CASES: HTR/HK HIGH CONDUCTIVITY HEATER HTR/LK LOW CONDUCTIVITY HEATER
		HT/S — HEAT SINK
		HV — HIGH VOLTAGE
		HVPS — HIGH VOLTAGE POWER SUPPLY
		HZ — HERTZ
		INST — INSTRUMENT
		INSUL — INSULATION
		INT — INTERNAL
		JETTS — JETTISON
		K — KELVIN
		KC — KILOCYCLES
		KHZ — KILOHERTZ
		KV — KILOVOLTS
		LAT — LATITUDE
		LBR — LOW BIT RATE
		LEAM — LUNAR EJECTA AND METEORITES
		LEO — LUNAR EXPERIMENTS OFFICER
		LM — LUNAR MODULE
		LMS — LUNAR MASS SPECTROMETER
		LO — LUNAR ORBIT
		L.O. — LOCAL OSCILLATOR
		LONG — LONGITUDE
		LOS — LOSS OF SIGNAL
		LP — LONG PERIOD (PSE SENSORS)
		LRV — LUNAR ROVING VEHICLE
		LSB — LEAST SIGNIFICANT BIT
		LSD — LEAST SIGNIFICANT DATA
		LSG — LUNAR SURFACE GRAVIMETER
		LSP — LUNAR SURFACE PROFILING
		LVL — LEVEL
		MA — MILLIAMPERE
		MALF — MALFUNCTION
		MAP — MESSAGE ACCEPTANCE PULSE
		MC — MEGAYCLE
		MCC — MISSION CONTROL CENTER
		MDE — MODE
		MEV — MILLION ELECTRON VOLTS
		MHZ — MEGAHERTZ

R	ITEM	
		MDCR — MISSION OPERATIONS CONTROL ROOM
		MOD — MODULE
		MODE — OPERATING MODES ARE DEFINED AS FOLLOWS FOR HFE: MODE GRADIENT MODE MODE/HK HIGH CONDUCTIVITY MODE MODE/LK LOW CONDUCTIVITY MODE
		MRO — MEMORY READOUT MODE
		MS — MILLISECOND
		MSB — MOST SIGNIFICANT BIT
		MSD — MOST SIGNIFICANT DATA
		MSFN — MANNED SPACE FLIGHT NETWORK
		MTR — MOTOR - ON PSE, THE THREE MOTORS ARE MTRX, MTRY, AND MTRZ.
		MUX — MULTIPLEX
		MV — MILLIVOLTS
		MW/CM2 — MILLIWATTS PER SQUARE CENTIMETER
		NA — NANOAMPERES
		NBR — NORMAL BIT RATE
		OPER — OPERATE
		OSC — OSCILLATOR
		PA — POWER AMPLIFIER; PICOAMPERES
		PCM — PULSE CODE MODULATION
		PCU — POWER CONDITIONING UNIT
		PDR — POWER DISSIPATION RESISTOR
		PDU — POWER DISTRIBUTION UNIT
		PET — PACKAGE ELAPSED TIME
		P&FS — PARTICLES AND FIELD SUBSATELLITE
		PHYS — PHYSICAL - ON CPE, USED AS FOLLOWS: PHYS/AN PHYSICAL ANALYZER (SENSOR ASSEMBLY)
		PLT — PLATE
		PM — PHASE MODULATION
		PRE/LTM — PRE-LIMITING
		P/S — POWER SUPPLY
		R — RESISTOR (USED AS R1 AND R2)
		RCVR — RECEIVER
		RDT — RING SENSOR DELTA TEMPERATURE (HFE)
		REF — REFERENCE
		RF — RADIO FREQUENCY
		R/S — REMOTE SITE
		RST — RESET
		RT — RING SENSOR AMBIENT TEMPEPATURE (HFE); REAL TIME
		RTC — REAL-TIME COMMAND
		RTG — RADIOSOTOPE THERMOELECTRIC GENERATOR
		RX — RECEIVER
		SCI — SCIENTIFIC
		SEL — SELECT
		SEQ — SEQUENCE, SEQUENTIAL: USED ON HFE AS: SEQ/FUL FULL SEQUENCE SEQ/P1 PROBE 1 SEQUENCE SEQ/P2 PROBE 2 SEQUENCE USED ON ASE AS: SEQ/S SEQUENTIAL SINGLE
		SEQ — SCIENTIFIC EQUIPMENT
		SIDE — SUPRATHERMAL ION DETECTOR EXPERIMENT
		SNSR — SENSOR
		SP — SHORT PERIOD (PSE SENSOR)
		SPST — SINGLE POLE SINGLE THROW
		S/S — SAMPLES PER SECOND; SIGNAL STRENGTH
		SE — SWITCH
		SWS — SOLAR WIND SPECTROMETER
		SYNC — SYNCHRONIZATION

R	ITEM	
		TC — THERMOCOUPLE (ON HFE, FOUR CABLE AMBIENT TEMPERATURES ARE READ ON EACH PROBE)
		TEC — TRANSEARTH COAST
		TLC — TRANSLUNAR COAST
		TM — TELEMETRY
		TS — TELEMETRY STORAGE
		TSF — TELEMETRY STORE FAST
		TSN — TELEMETRY STORE NORMAL
		TX — TRANSMITTER
		USB — UNIFIED S-BAND
		UVP — UNDERVOLTAGE PROTECTION CIRCUIT
		V — VELOCITY (USED TO INDICATE "SPEED" ON PSE IN "LVL DIR/V")
		VCO — VOLTAGE CONTROLLED OSCILLATOR
		V/FILT — VELOCITY FILTER, A COMPONENT OF SIDE
		W — WATTS
		W1, W2, W3 — WALL LOCATIONS OF STRUCTURE TEMPERATURE SENSORS
		XMTR — TRANSMITTER
		XTAL — CRYSTAL
		XYA — AXES OF LSM, WHERE XYO INDICATES
		XYO — X, OR Y, OR NEITHER

B DISTRIBUTION
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R	ITEM

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C CHANGE
CONTROL

R	ITEM

CHANGE CONTROL

1.0 INTRODUCTION

1.1 PURPOSE

THE PURPOSE OF THIS APPENDIX IS TO DELINEATE CHANGE CONTROL PROCEDURES FOR THE MISSION RULES. THIS WILL INSURE THE PROPER COORDINATION OF CHANGES, PROVIDE A RECORD OF PROPOSED CHANGES (INCLUDING THE RATIONALE FOR MAKING THEM), AND PROVIDE A MEANS FOR PROMULGATING INDIVIDUAL RULE UPDATES BETWEEN REVISIONS (INTERIM CHANGES).

1.2 EFFECTIVITY

OCTOBER 15, 1972

2.0 CHANGE PROCEDURES

2.1 SUBMISSION OF CHANGES

PROPOSED CHANGES ARE SOLICITED FROM ANY INDIVIDUAL OR ORGANIZATION HAVING A VALID INPUT. ALL CHANGES WILL BE SUBMITTED DIRECTLY TO THE CHIEF, FLIGHT OPERATIONS AND RECOVERY BRANCH (FORB), FCD.

2.1.1 FORMAT

PERSONS DESIRING TO SUBMIT A PROPOSED CHANGE WILL REDLINE A PAGE FROM THIS DOCUMENT OR REWRITE THE RULE, USING THE STANDARD MISSION RULE FORMAT. ALL PROPOSED CHANGES WILL BE SUPPORTED BY RATIONALE. TWO COPIES WILL THEN BE FORWARDED TO FORB.

2.2 APPROVAL

2.2.1 COORDINATION

THE ORIGINATOR OF THE CHANGE MAY OBTAIN PRELIMINARY CONCURRENCES. FORB WILL OBTAIN FORMAL CONCURRENCES FROM THE CHIEF, LUNAR EARTH/EXPERIMENTS BRANCH AND THE CHIEF, FLIGHT CONTROL DIVISION.

2.2.2 SIGNOFF/DISAPPROVAL

UPON OBTAINING THE REQUIRED CONCURRENCES OR NEGATIVE COMMENTS, THE AFD WILL PRESENT THE PROPOSED CHANGE TO THE FLIGHT DIRECTOR FOR FINAL APPROVAL OR DISAPPROVAL. THE AFD MAY SIGN OFF OR DISAPPROVE PROPOSED CHANGES IN THE ABSENCE OF THE FLIGHT DIRECTOR.

R	ITEM

2.2.3 DISAPPROVED CHANGES

IF A CHANGE IS DISAPPROVED, FCOB WILL RETURN THE COPY TO THE ORIGINATOR. A COPY OF THE REQUESTED CHANGE WILL BE RETAINED FOR FUTURE REFERENCE.

2.3 PUBLICATION AND DISTRIBUTION OF INTERIM CHANGES

INTERIM CHANGES WILL BE DISTRIBUTED VIA AN ABBREVIATED DISTRIBUTION LIST CONSISTING OF THE MISSION CONTROL TEAM, PERTINENT NASA ORGANIZATIONS, AND THE APPROPRIATE CONTRACTOR(S).

3.0 REVISIONS

3.1 DEVELOPMENT

FCOB WILL COMPILE THE EFFECTIVE INTERIM CHANGES AND CORRECTIONS OF MINOR TYPOGRAPHICAL ERRORS INTO COMPLETE PAGE CHANGES TO THE BASIC DOCUMENT. ("PEN AND INK" CHANGES MAY BE USED TO CORRECT TYPOGRAPHICAL ERRORS IF THERE ARE NO OTHER CHANGES ON THE PAGE CONCERNED.)

3.2 APPROVAL

ALL REVISIONS WILL BE APPROVED BY THE DIRECTOR OF FLIGHT OPERATIONS AND THE MANAGER, APOLLO SPACECRAFT PROGRAM.

3.3 PUBLICATION

3.3.1 SCHEDULE

REVISIONS WILL BE MADE ON AN "AS REQUIRED" BASIS.

3.3.2 DISTRIBUTION

REVISIONS WILL BE PRINTED AND DISTRIBUTED ACCORDING TO APPENDIX B.

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APOLLO

FEMR

FINAL EXPERIMENTS MISSION RULES

APOLLO 17

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